City of Gainesville

Work Plan for the Development of an Integrated Municipal Information System

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Work Plan for the Development of an Integrated Municipal Information System

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Section I

Introduction

Section I

Introduction

As the demands on cities continue to increase for an expanded level of service, so do the demands increase for lower tax rates. The two are incompatible and place local governments right in the middle of a bind. It is an extremely challenging position for any city to meet this increased demand for service while, at a minimum, holding the costs of providing the service at the same level. In order to accomplish this feat, it is necessary for the executive and operational management to make use of every managerial tool available to them. One such tool is the computer.

The City of Gainesville, as have many other cities, has turned to computer technology to find some additional tools to aid in the management of city affairs. In taking this step initially, the city had to investigate various approaches to making a computer operate effectively and efficiently. A review of the state of the art in information systems technology and the conduct of an orientation and training session for all city management convinced the city personnel that the city does, in fact, have need of a computer. However, prior to ordering that computer, the city would like to know exactly how the computer will be used, why, and how much it will cost. These legitimate concerns about the installation of computers have led the city to an orderly, logical and methodical approach to the development of computer based information systems.

The concept which Gainesville has chosen to follow is that of the Integrated Municipal Information System. Section II of this paper explains this concept, Section III outlines a general development plan, Section IV states the cities' objectives for the development of such a system, Section V provides the first year detailed work plan, Section VI outlines the general plan for the second year, and Section VII draws the conclusions.

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The City of Gainesville has been awarded a Section 701 - Comprehensive Planning Grant from the United States Department of Housing and Urban Development. A portion of that grant is for strengthening the role of the chief executive in the planning process. Gainesville has chosen to approach this goal through the development of information systems. It is to this end that the following material speaks.

Section II

Environment for Development of Integrated Municipal Information Systems

Section II

Environment for Development of Integrated Municipal Information Systems

During the past year, the City of Gainesville has expended considerable time and resources in making the determination of the exact route which should be taken in development of an automated information system. The history of information processing in local governments has been a valuable asset to enable Gainesville choose between various alternative approaches. Using this information and the experiences of a number of local governments across the nation, Gainesville has chosen the more systematic, logical approach to information systems development - The Integrated Municipal Information System Approach. By way of a background summary of this approach, the following material is offered.

The principles and ideas embodied in an IMIS are not new. They have been discussed and applied in various phases for a number of years. They are only part of a large body of ideas which have evolved from the fields of management, economics, psychology, operations research, data processing and others. They have been combined, however, into a specific set of concepts which have the potential for making a significant contribution to the governing of our cities. For management, administrators and operational personnel, the body of concepts has tremendous promise in terms of improvement of the delivery of services. However, to realize this promise, an IMIS must be understood in terms of its broadest implications and must have the full commitment and support of city personnel from the highest executive office to the person who actually performs the daily detail ensuring that the government machinery continues to function.

This section of the report will attempt to enhance that understanding and commitment by defining some major terms and discussing the nine basic IMIS concepts. The point of departure is an examination of each of the words in the name "integrated municipal information systems".

Integrated

When viewed in the context of an IMIS, integration encompasses the linking of all the processes of government into a smoothly functioning whole. When applied to the individual components of the total system of government, the term refers to the relationship of any one part to all other parts. Taken one step further, when applied to a component of an information subsystem, the term references the linkage between elements of the subsystem in relation to the whole. When taken to the finest detail, the term indicates the relevance of each data element to all applications which it might serve. For example, one record from a land use file might be used for assessing, fire records, civil defense, land use and planning education needs. This one record, therefore, relates to the Public Safety subsystem, the Physical and Economic subsystem, the Human Resources subsystem and the Finance subsystem. Each of these subsystems are, in turn, related to the total system through the land use file. The data making up the land use file is generated once to serve the needs of many departments. The elimination of redundancy in data collection, storage, validation and updating gives one an indication of the tremendous degree of efficiency which is possible. The data element serves, therefore, as a key to linking or integrating the various city departments into a unifying whole.

Municipal

The word municipal describes a key element in the building of an IMIS because it describes the unit of government which is the closest to the source of data, i.e., the basic building block of information for other levels and jurisdictions of government. This unit of government has the need for data, the authority to collect the data and the established mechanisms for collecting the data. Municipal, in this context, refers to the general purpose governmental units

such as cities and in some cases counties. In the Urban Information Systems Inter-Agency Committee (USAC) project, the term was restricted to cities; future research is anticipated in other types of local government. The entire IMIS approach grew out of research done by this project. Prior to this project, there did not exist a coherent, collected body of principles upon which to base the mushrooming systems analysis profession in the field of information and data processing.

Information

Information refers to the communication or reception of knowledge or intelligence. The term has frequently been used interchangeably with the term data, especially in the data processing environment. In the context of IMIS, the distinction between information and data is of critical importance. Data refers to the symbols, numbers and letters which are processed and stored. Each item of data is, in and of itself, without meaning. It is only when the data elements are combined and meaning is attributed to the combination, by a human, that the elements become information. For example, the individual symbols 3 0 1 M A I N S T R E E T (see Figure II-1) taken one at a time have no meaning. But the combination of the individual data items into 301 Main Street and the knowledge that this is the address of a local retail establishment provide information. In an integrated system each item is carefully stored so that it can be provided to each function of government requiring knowledge of the item for delivery of services. The example provided above, 301 Main Street, illustrates a piece of information which will have entirely different meanings and be used for entirely different purposes by assessors, fire departments, civil defense departments, land planning personnel, educational personnel, and voter registration personnel.

In short, adequate definition of the term "information" must consider (1) the actual symbols, (2) the combination of symbols as well as the personal reference of the individual who is analyzing the combined data and (3) the exact use to which the data is put in the performance of municipal functions.

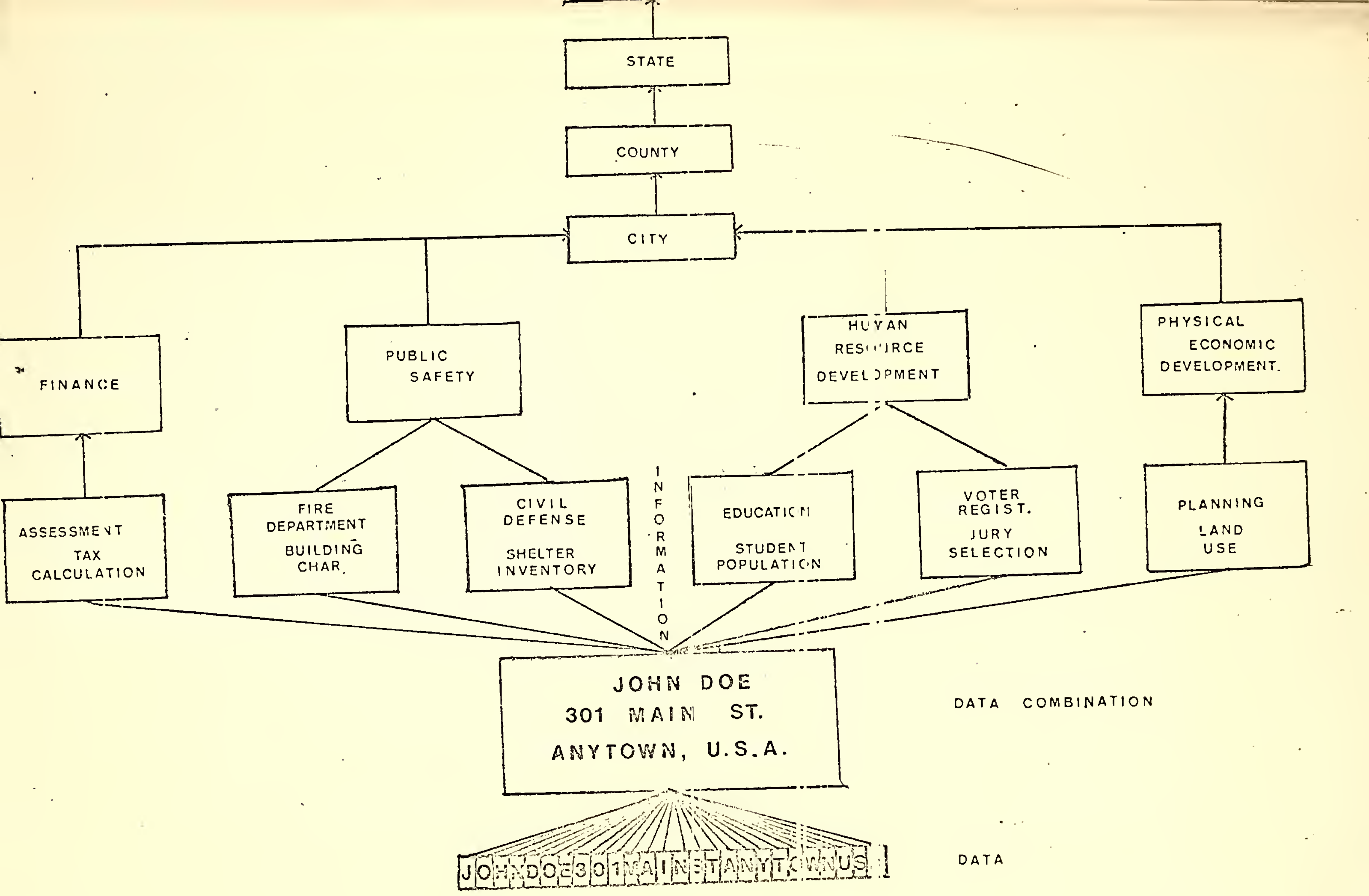
STATE
COUNTY
CITY
FINANCE
PUBLIC SAFETY
HUMAN RESOURCE DEVELOPMENT
PHYSICAL ECONOMIC DEVELOPMENT.
ASSESSMENT TAX CALCULATION
FIRE DEPARTMENT BUILDING CHAR.
CIVIL DEFENSE SHELTER INVENTORY
INFORMATION
EDUCATION STUDENT POPULATION
VOTER REGIST. JURY SELECTION
PLANNING LAND USE
JOHN DOE
301 MAIN ST.
ANYTOWN, U.S.A.
DATA COMBINATION
JOHNDOE301MAINSTANYTOWNUS
DATA

FIGURE II-1

System

The term system has been used in many ways and has a variety of meanings. Within the context of an IMIS the term has two distinct meanings. The first meaning of the term relates to the system of delivery of services and encompasses all municipal functions. If the municipality is viewed as a total system (See Figure II-2) the traditional functions and organizational lines are no longer as significant as they were. Municipal activities are viewed as related subsystems within the total system. Each constitutes a set of resources which can be brought to bear on the problems confronting cities.

The second meaning of the term relates to the technical meaning within the context of the data processing environment which permits the city to operate. To maximize its effectiveness the municipality has an information system. This system refers to a perspective for the identification of data, the description of the data, the relationships of various data items, the processes for data utilization, the sources of data, the flow of data through the government, the flow of data in a time stream, the manner of data utilization in the municipal process, the utilization of data in assessing community needs and the manner in which the data is stored, retrieved and reported. The information system refers to the data, the people and the processes by which the municipal government operates.

The municipal system must include, as well, the influences of outside agencies and jurisdictions. It disseminates data to and receives data from outside agencies. While these relationships may be outside the current effort they must be recognized and considered in the planning of an IMIS.

The totality of an IMIS consists of a basic set of building blocks as seen in Figure II-1. The complete understanding of these building blocks enables one to view the basic IMIS concepts in their broadest sense and to realize the full

EGRATED MUNICIPAL INFORMATION SYSTEM

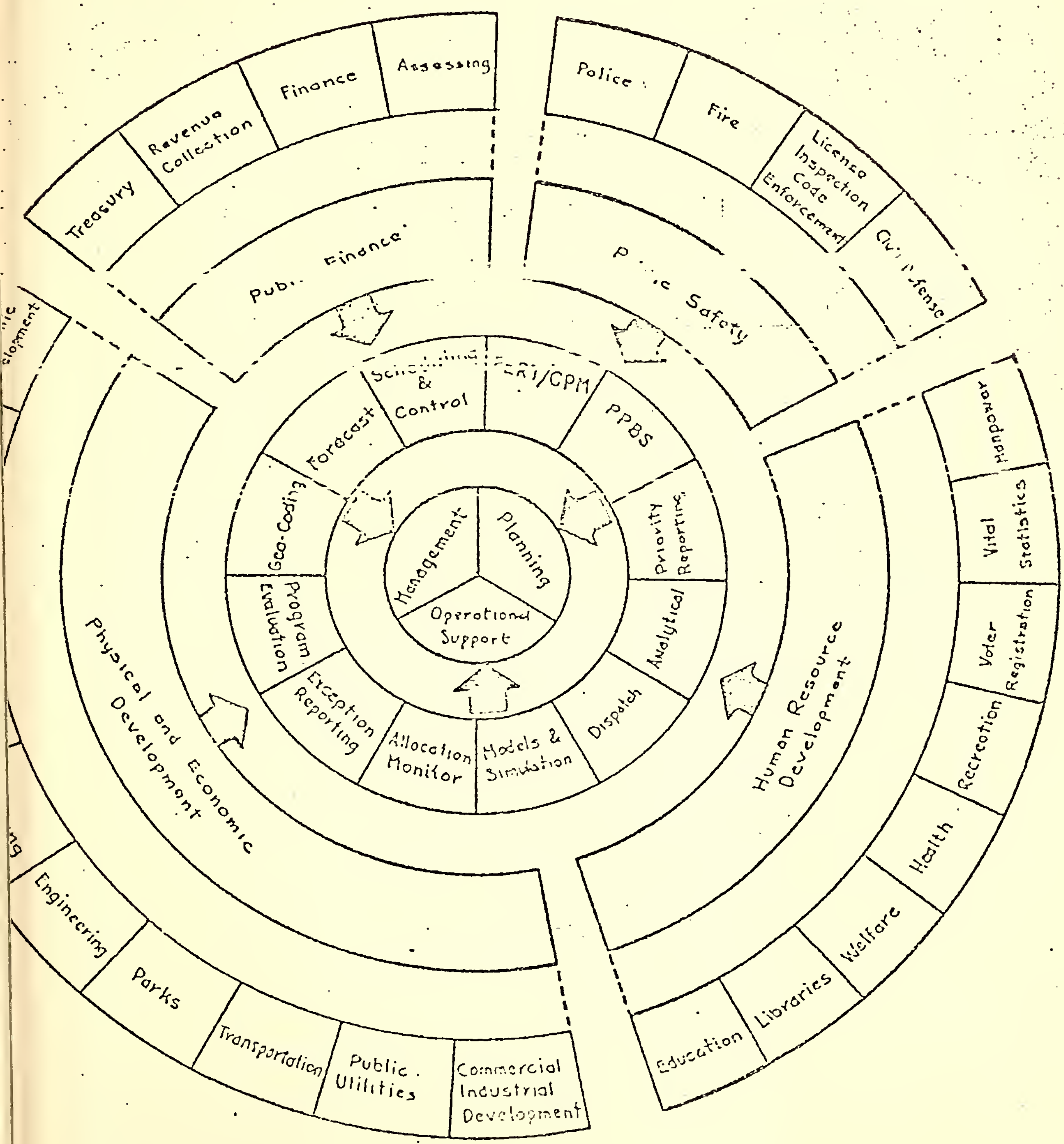

Figure II-2

potential of such a body of concepts.

Even with the fullest understanding of the meaning of an IMIS, within the framework of terminology, there still remains the problem of understanding the manner in which an IMIS functions and the purposes it serves. These functions and purposes can best be described using the nine basic concepts of an IMIS. These concepts now comprise the basic components of the research being undertaken in the USAC cities. They are as follows:

1. *Integrated data processing systems should interrelate municipal processes.* No single function of government stands alone. Each function must provide information to and receive information from other governmental activities. An IMIS examines these interrelationships with respect to the commonality between data, information, processes and services. These interrelationships are defined, examined for duplication of effort and, in many cases, re-defined for a smoother flow of data from point to point.

2. *A fundamental analysis of municipal operations and identification of related data processing components is a precondition to the effective use of computers.* Operational processes, principals and rules tend to evolve out of the pressures of the day-to-day activities necessary to provide service to citizens. Continued pressure inhibits the analysis of operational procedures, on a periodic basis, to determine their effectiveness and need for possible modification. The tremendous investment of time and dollars required for entrance into the field of computer usage *demands* a thorough review of operational practices to minimize the computerization of ineffective techniques. This analysis provides management with an opportunity to *restructure* the operational procedures of its departments, utilizing the latest proven techniques, to *enhance* the delivery of services. For example, the

review of municipal operations in Long Beach, California showed that the 800 employees of the Police Department generated and used 1088 forms which were stored in 1048 files. Since this review, the department has eliminated 400 forms, established a forms control catalogue and forms procedures for the continued reduction of numbers of forms and files.

3. A systems approach is required throughout the development process. The previous efforts devoted to the use of computers in local government situations have been, by and large, fragmented efforts. One operation or application was considered by itself without a determination of its effect on the remainder of the local government system. All of the municipal processes and data interrelationships must be considered as well as the interaction between people and machines. The effect of any one application must be viewed in terms of its localized benefits but must, also, be considered in relationship to every point, which may be affected, in the total government system.

4. Automation of routine municipal processes is a fundamental condition to the realization of an IMIS. It is a major objective of an IMIS to reduce human involvement in routine, mundane processes to a minimum. To accomplish this objective, one must identify the decisions which a machine can make and those which require the judgment of humans. The automation of those decisions which are routine and which have precisely defined rules will free personnel to attend to those matters which the machine cannot handle. However, to achieve success, a major challenge is to condition employees to the use of the computer, much as they use the typewriter, as a tool which complements their own skill.

5. The automation of municipal operations must exploit the full range of computer technology. Computer technology encompasses the hardware, software, algorithms, i.e., a system or rules of procedure for handling a specific task, data base management techniques, data acquisition, synthesis, analysis and reporting, people, organization theory, management and control of all of these processes. To effectively implement an IMIS each of these elements must be explored to determine the most effective and proven methodology. To not explore each of these areas, will deprive the city of major benefits in using this tool to solve community needs.

6. An IMIS views the municipality as a basic building block for intergovernmental information systems. To view the city as a total system, operating within a vacuum, is useful from a preliminary analysis viewpoint. However, it soon becomes quite apparent that city governments receive much information from state governments, the federal government and other governmental jurisdictions. Each of these elements of government must, also, receive a great deal of information from cities to formulate programs of support and assistance for the cities. The cities are viewed as the basic building block for this exchange of information since they are the governmental unit which is closest to the source of information -- the people. The personnel who design an IMIS must examine each of the lines of communication and the points where cities interact with other governmental agencies. They must determine the types of information to be exchanged, the processes involved, the uses of the information and the criticality of such information. It is only when the basic building block provides a solid foundation that the entire structure will stand. The reader is referred, once again, to Figure II-1 as an illustration of the building block concept.

7. Municipal information systems are by-products of computer driven operations based systems. IMIS is not, in the traditional sense, a management information system. It is a municipal information system which has its impetus at the source of information, i.e., the daily operations of the local government. It is a body of concepts which recognizes the available power of the computer and sees the opportunity for full utilization of the computer in performing local government operations. The IMIS concepts are based on the idea that full exploitation of the computer's power at the operational level will provide, as a by-product, administrative and management information. Thus, it seeks to provide municipal information to management based on the dynamic environment in which operational data is collected. To do so, IMIS takes advantage of the technology represented by the computer as a tool for improving the operations of city government.

8. Adequately designed data processing systems can be transferred from one municipality to another. One of the primary problems in the effective utilization of computers across local government environments has been the major cost involved in the development of computer systems and software. Each governmental unit has found it necessary to develop its own systems and software; tailor-made to its own environment. Intuitive feeling and some pragmatic results have, however, demonstrated some degree of transferability of computer techniques between cities; the obvious result being a decrease in costs to achieve benefits of knowledge developed elsewhere. The common thrust of IMIS is the degree of transfer of concepts, processes and products.

9. The integrated approach to municipal systems development must pro-

ceed on the basis of a plan within which incremental installation may be achieved in accordance with the priorities and resources of any particular city. The development of an IMIS requires a commitment and a level of expenditure never before associated with computer-based systems. It is recognized, however, that it will not be possible to pick up a total system or subsystem from any one of the six USAC cities and "plug" the system into other cities across the nations. Once the body of concepts is fully understood and the commitment is made to initiate an IMIS, certain discrete steps will have to be made. Each of these steps has been or is being taken by the six involved cities. Their IMIS development is modular in nature and is being documented. It is anticipated that these modules or increments can be chosen by each city based on their own priorities and resources. Certain modules will be considered absolutely necessary with others being optional.

While it is recognized that this section of the report has been devoted to only a cursory review of the philosophy of an IMIS, it is anticipated that it will provide the framework for looking more deeply at the methodology chosen by Gainesville in the development of its information system.

Section III

Integrated Municipal Information Systems General Project Plan

Section III

Integrated Municipal Information Systems General Project Plan

Within the total context of an integrated municipal information system as described in Section II, there is a certain general plan which must be followed in order to obtain maximum benefit of this approach to building information systems. This broad general plan consists of the following steps:

A. Systems Analysis

B. Systems Conceptualization

C. Systems Design

D. Systems Development

E. Systems Implementation

F. Systems Evaluation

While each of these steps must be accomplished, the time frame for each is shortened considerably by the effective use of methods, forms, techniques and documentation of work undertaken by other cities, i.e. process transfer. This transfer process will be emphasized very heavily throughout the entire development effort in order to effectively reduce costs and speed up the entire process.

The six general steps will be highlighted below as additional background to support the overall development strategy detailed in the latter sections of this report.

Systems Analysis

Systems Analysis is a process by which one can obtain a broad overview as well as a detailed look at the entire operation being considered as part of the information system. This technique includes an analysis of the municipal government process as a service delivery system, analyses of current operations, decision analysis and analysis of information needs. This data gathering synthesis of findings and presentation of alternatives is the basic block for the entire development effort.

Systems Conceptualization

Systems Conceptualization involves taking a very coarse look at the total information system as it currently exists and anticipating what the ideal system should be. The rationale for a proposed system is developed by relating parts of the conceptualized system to the whole, examining linkages between different departments and ensuring that information will be provided to decision makers when and how they need it. The Systems Conceptualization serves as a broad scale road map to continue to guide the development effort. It is an iterative process which begins with the first data collection and continues in mental process cycles through the systems development activity.

Systems Design

Systems Design is the process by which the conceptualized system is matched in greater detail with the precise needs of each department, the precise computer program requirements, the precise data requirements and the precise computer hardware constraints. The system is designed around the acquisition of data, error detection, correction, audit and control, detailed system specifications, but with the enhancement of daily operations performance as the primary goal.

Systems Development

Systems development refers to the activities closely associated with computer programming, data base development and documentation of forms and procedures. The forms and procedures are developed first and may be put into practice on a pilot basis to test them while other elements of the system are being developed. General written specifications for computer programs are translated into precise logic design, flow charted, coded, tested and documented. Data acquisition procedures, data collection forms, translation of data to machine readable form, the creation of a data base from day to day departmental operations and updating procedures for maintenance of current data bases all fall within the systems development effort.

Systems Implementation

Many ideas have been conceived, designed, set down on paper and developed. But, until one is successfully implemented its value will not be truly known. Systems implementation is the result of the detailed planning of every phase of the operations, the anticipation of what might go wrong and the correction of those deficiencies. It involves coordination of people, procedures, forms, computers, computer programs, and management of data all running together and smoothly under conditions of "live operation." Testing of each individual part, their relationship to the whole and the system as a whole have led to this point in time. The user now can reap the rewards for the effort.

Systems Evaluation

Most systems are not static in nature. Any system which involves humans will be dynamic and will be changing on a daily basis. The integrated information system is made up of many elements, most of which relate to humans. Therefore,

the system will require modification and change for some time to come. Effective procedures must be planned, designed and implemented in order to evaluate the system, change it where required and continue its responsiveness to the user.

This preceeding brief discussion of the overall general systems development plan serves as a point of reference for progress at any time during the development effort. The next section will discuss the first step which Gainesville desires to undertake; Systems Analysis as it relates to the city objectives.

SECTION IV

GAINESVILLE OBJECTIVES FOR IMIS

Section IV

Gainesville Objectives for IMIS

In the development of information systems, one of the first steps is to undertake a definition of the objectives for development of the system. The City of Gainesville places high priority on encouraging management to strengthen its role in the local government environment; in particular, in the planning process. To accomplish this activity requires the aid and assistance from a number of management tools. The specific goal toward which Gainesville is moving is one of developing a more effective management capacity in the determination of city needs, the development and evaluation of programs and the carrying out of required management activities for planning. This broad goal can best be achieved through the development of an integrated information system.

With this in mind, the City of Gainesville, in conjunction with Public Technology, Inc., has initiated a review of municipal research in the area of information systems development; in particular, research undertaken as part of the USAC program mentioned earlier. The results of this research will be integrated into the entire systems analysis and systems conceptualization effort. It is anticipated that this research will be used as a basis of both of these activities and that forms, methodologies and techniques will be transferred to Gainesville as this work begins. It will not be necessary, therefore, to redevelop these forms and methodologies in the Gainesville project. Gainesville will, thus, achieve a large degree of savings in time and personnel resources by taking advantage of the efforts of others.

Throughout Systems Analysis, a number of specific objectives will guide the project teams. Several of these objectives have been stated below:

- To examine the total system as a system of activities through the development of a Functional Area by Service Provider Matrix.

- To examine the processes of government in the City of Gainesville as the city currently operates.

- To examine the formal and informal communication channels as a prerequisite to the installation of an integrated information system.

- To examine the total service delivery system with respect to responsibilities and needs both present and future.

- To investigate procedures, forms, methods, records, files and reports both as a means of understanding the system and as a means of assisting operating personnel in improving current methods of operation.

- To define the point at which decisions are made in the city government -- including types of decisions, person who makes the decisions, routine decisions versus exceptional decisions, and the type of information needed to support these decisions.

- To conduct an information analysis including the data that is generated throughout the city, the source of the data, the manner in which it is processed, its use, the output generated from it, its utility and the means by which the data is combined into useful information.

Two important points should be re-emphasized. The first is that the work which has already been done by other cities will be used as a road map to guide Gainesville and to decrease the amount of time and effort required to complete the process. This is the concept of technology transfer at work. Secondly, it is not a foregone conclusion that systems analysis will lead to complete automation in every area of city government. It may, in fact, be used to strengthen already existing operating procedures which are efficient and effective. It will, most certainly, lead to a re-evaluation of some operating procedures and provide the department management with an opportunity to improve some of their existing procedures and policies. The point is that, regardless of whether all elements of city government are automated, tremendous benefits are anticipated as a result of the total analysis process.

Much already has been accomplished in terms of common understanding and co-operation of functional department heads as a result of the Systems Concepts Seminar, in which Public Technology participated, in the city of Gainesville. Common agreement on the specific approach to be taken by a particular municipal organization is important in any endeavor, in particular one with the history of emotional internal conflicts such as those generated by debate over the use of a computer.

The functional department heads have already specified their interest in the manner in which the computer can help in their department. They have, also, reviewed the necessity for systems analysis, for utilization of internal staff to complete the project and for a team work approach in the entire system development. It is only through this approach that the objectives of the City of Gainesville can be met in a planned, orderly and logical manner.

Section V

Integrated Municipal Information System Detailed Project Plan

Section V

Integrated Municipal Information System
Detailed Project Plan

The words, "Plan your work and work your plan," are never so appropriate as when developing a computer-based information system; particularly an integrated municipal information system which provides for data base linkages, automation of routine decisions, multiple use of data and horizontal as well as vertical perspectives in systems utility.

The following detailed project plan has been developed to guide the City of Gainesville as it proceeds in this area. The work plan will be for one year's duration and will be laid out under the following major topics:

A. Organization
B. Management
C. Systems Analysis
D. Transfer Research

A. Organization

The organization of the project is one of the critical first steps and will have major impact on the entire life of the project. Major support of the project is required at the political level, the top management level, and the operating level. To insure these support levels, the city will:

1. Appoint a Policy Board of individuals best qualified to assess the system and its responsiveness to enhancement of the delivery of services. The Policy Board will have the following duties:

a. Define and specify the policies which will guide the overall project.

b. Integrate policy matters of the project with overall city policies.

c. Determine priorities relating to the overall project implementation.

d. Coordinate the efforts of any assistance received from outside the municipal government; i.e., consultants, universities or other organizations.

e. Coordinate project efforts affecting other jurisdictions and provide the interface between the City and the County, Regional, State, or Federal agencies.

f. Evaluate the effectiveness of the project phases in terms of the benefits to the city.

g. Provide the authority and resources to the User Steering Committee and the project manager so as to facilitate project development.

2. Appoint a User Steering Committee with top management representation from each functional area of government which is participating in the project development. This committee will serve as an operating committee whose primary responsibilities will be to:

a. Assist the Project Manager in day-to-day operational needs.

b. Continuously involve municipal employees through assignment to work on specific problems.

c. Dissemination of information concerning the project.

d. Recommendations to Policy Board on such matters as individual privacy and information security, data access control and data acquisition.

3. Assignment of full time Integrated Municipal Information Systems Coordinator (Project Manager) to the City Manager's office. This project manager will have the following responsibilities:

a. Setting objective for the Project

b. Project Planning

c. Allocation of Resources

d. Development of Detailed Work Plans

e. Selection and Motivation of Personnel

f. Control of All Project Functions

g. Orientation and Training

h. Project Review

i. Project Evaluation

4. Each and every functional department which is involved in the project will provide one staff person half time to be assigned to project teams for purposes of conducting systems analysis. These personnel will be organized into specific project teams under the responsibility of the Project Manager.

Once the initial organization, i.e., Policy Board and User Steering Committee, is in place and beginning to function, it will be necessary to appoint three staff members to become the nucleus of the project team. The three appointees will be the Project Manager, Management Analyst, and Computer Systems Specialist. When this nucleus is on board and functioning, the first assignments will be in the area of staffing, training, development of the management plan, and organizing the Systems Analysis effort. In the area of staffing, the following will be accomplished:

- Review the type of staff, qualifications, availability, salary requirements and anticipated contribution for all staff to complete the project on both a long term and a short term basis. For assistance in this task, the Project Manager will utilize the work of Public Technology, Inc., as defined in the paper "Organizing to Develop an Integrated Municipal Information System" This research work will become the point of departure.

- Resource Assessment and Selection - In this context, resource refers to people, dollars and equipment. In the area of personnel assessment and selection, the Project Manager will utilize the results of the above review of staff to determine the short term staff needs for the project. He will participate with each functional department head in the selection of the staff man from that department on the basis of expertise, interest in the integrated approach and aptitude in electronic data processing as measured by computer hardware manufacturers aptitude tests.

  In the area of dollars, the Project Manager will develop projections of required expenditures on a quarterly basis and be always reviewing potential sources of funding for project completion.

In actually conducting the analysis of information flow, decisions and municipal processes, a number of computer programs are available to tabulate the results of such analysis. Three of these programs, I.E., Meta-Data, Rate and Data Cataloguer, are available from the USAC project. It will be necessary to explore the computer requirements for these programs at the Alachua County Data Processing facility, at the University of Florida, and at nearby service bureaus. This assessment should consider the needs of the project, but should also consider the total short run needs of the city for computer usage.

- In the area of training, four levels will be conducted by the project team. These levels are:

- Continuous orientation of all employees with respect to the project and its functioning in order to continue to insure participation and coordination at all levels.
- Orientation and Training in Systems Analysis Methodology and Techniques for all staff who will be involved in systems analysis.
- Informal discussion with all persons being interviewed.
- Informal duscussions with all persons doing interviewing.

The whole success of the Systems Analysis effort depends on the cooperation and participation of the entire project team. These orientation and training sessions, as insignificant as they may seem, are of vital importance, and will be adhered to.

The work of the project team nucleus in management of the system development and the scope of systems analysis will be covered below.

B. Management

The ultimate responsibility and authority for the conduct of the project effort will be with the Policy Board. The Project Manager will, however, have responsibility for the day-to-day operations of the project. In planning, managing, and controlling the project, he will have a number of tools at his disposal. Several of these are mentioned below to illustrate the kind of project control which is anticipated.

1. Development of a detailed work plan - While the content of this document is at a very detailed level, it will be necessary for the project team to develop a work plan at a level of detail which shows, for example, who will be interviewed on which weeks, who will do the interviewing, when the documentation will be completed, and when the interviewee will be requested to approve the interview. While it may appear to some that this level of detail is too exacting, it will insure complete, scheduled and timely results by minimizing wasted time and maximizing productive time.
2. Development of Time Phase Plans or Program Evaluation Review Techniques (PERT) for monitoring major achievements against anticipated milestones. The PERT network can be easily drawn by hand and will be used because of its flexibility and versatility in showing more than one dimension of activity simultaneously. In developing this network, provision will be made for project start-up and the possibility that a lag may develop in assembling the project teams.
3. Additional control mechanisms, already existent in the city will be used to control resource allocation, expenditure of funds and use of computer time.

C. Systems Analysis

Systems Analysis will be conducted as the base upon which the entire integrated municipal information system will be built. The scope of the systems analysis will be as follows:

1. A Functional Area by Service Provider Matrix will be developed as a first step in the broad overall view of the total city. This matrix will enable the User Steering Committee and Policy Review Board to determine their first priorities for detailed systems analysis. Based on preliminary reviews of the various functional areas by Public Technology and city staff, the Physical and Economic Development Subsystem appears as a likely candidate for the first area of penetration.

2. Background Research will be continued as an ongoing activity to surface three things:

   a. Systems analysis forms, procedures, techniques, tools, review and decision-making criteria which can be transferred, from other institutions, to shorten the analysis time effort while building on what has already been done.

   b. Documented results of systems analysis which will provide flows of information, names of data items, names of files, decision analysis and other relevant material. The sole purpose of this effort is to move systems analysis toward a verification activity rather than a data gathering activity. This documentation would be provided to each analyst prior to his analysis in that activity.

   c. Documented results of conceptualized or designed systems which will enable one to, again, do at least initial conceptualization through verification rather than creation. Creativity will surface in determining the modifications required at minimal disruption to the already conceptualized o designed system.

3. Data Collection (Verification)

   Data Collection (verification) will be conducted to provide the data for analysis of:

   a. Municipal current operations - functions performed, flow of data, uses of data and timeliness of data requirements.

   b. Decisions, types of decisions, who makes the decisions, data required to support the decisions and routine versus exception decisions.

   c. Informational needs in terms of exact data items, files of data, sources of data, uses of data, requirements for data and reports containing data.

   d. Needs both present and future for information systems support.

Data Collection (verification) will be conducted as follows:

a. Collect background research on work others have done in the area being analysed and in the methods and techniques for analysis. This will determine whether the exercise is a data collection effort or a data verification effort.

b. Undergo orientation and training in systems analysis techniques, interview techniques and documentation of data collection effort.

c. Collect existing forms and documents, i.e., written descriptions of processes, personnel job descriptions, sample forms and reports, file names and contents and organization charts.

d. Conduct background research to understand, thoroughly, the functions which the department is supposed to perform.

e. Collect data in one of the following three ways:

    (1) Interviews - In the case of an interview, which allows the interviewer a great amount of latitude in the areas he covers, the process should be planned and exact questions prepared, prescheduled and coordinated with department and project management personnel, conducted as rapidly and efficiently as possible and the results should be documented for approval by the interviewee. Once approved, the results should be filed for future analysis.

    (2) Search records - One of the reasons for collecting forms is to be able to ascertain the types, kinds and uses of data, their sources and the flow of data through a department. A thorough search of files and forms in the departments being analyzed will provide information as to numbers of forms, data duplication, data redundancy, data sources, data uses and percent of data collected which is really already existent. This information should be documented, reviewed with the project

director and approved by the departmental personnel prior to filing for later analysis.

(3) Sampling data and estimating - In some instances, the amount of data may be so large that it is not possible to collect all of the data. In these instances, data will be sampled, statistically analyzed and generalized to the universe. These results, however, will be reviewed with the project management and departmental personnel prior to filing for later analysis.

4. Data Summarization and Report of Findings - A summary document will be prepared, for internal working purposes only, which will provide a summary of all data collection efforts, kinds of data collected, kinds of files identified, and areas of the city which were not covered. This document will include the Functional Area by Service Provider Matrix.

D. Transfer Research

As the organization of the project, staffing, training, and data collection are being carried out by the Project Manager and the Management Analyst, a number of other activities must, also, be taking place. These activities relate to the preparation of the city for transfer of products from other cities around the country. These activities can be undertaken by the Computer Systems Specialist and are as follows:

1. Research into other systems in the country which are either in the conceptual stage, the design stage, or are already up and running in another city. This type of research can serve a twofold purpose. The first is to determine the functional exactness of the system and the potential modifications prior to implementation in Gainesville. The second is to determine the known or anticipated requirements for computer hardware as a prelude to equipment configuration at a later date.

2. An analysis of the computer hardware needs which the city currently has even though it is running on the Alachua County system.

3. An analysis of the types of hardware which are available, the manufacturers, specifications, uses, prices, peripheral equipment, timing, reliability, maintenance, and any other factor which will effect a lease, purchase or third party lease of computer equipment. This analysis should pay close attention to new products which are available and the interface between the various manufacturers' equipment.

4. An analysis of the Data Base Management Systems which are available today, their requirements in terms of computer equipment, their versatility, their language, and the environments in which they have been implemented.

5. Analysis of other software available, of differences between disk operating systems, tape operating systems, and operating systems.

   This analysis should review the various computer manufacturer's operating systems, the compatibility between the vendors, the general maintenance software available and the languages which can be handled on each machine.

The duties stated above will all have to be performed, in addition to ensuring that all of the computer work that is currently being done by the city remains on target and does not suffer a negative impact. The tremendous importance associated with this dual responsibility is twofold. The first reason is that at that moment in time when the City of Gainesville is ready to begin talking about obtaining a computer, they will be well ahead of most cities in that they will have a resident expert who can help to ensure that the city comes out ahead in hardware acquisition. The second reason for expending a resource in this way is that he will become thoroughly knowledgable in those systems which are available for transfer, their weaknesses, strengths, and the level of modification which may be required to bring them to a level for transfer into Gainesville. This activity will be coordinated through the Computer Software Exchange Program of Public Technology,

Incorporated and through governmental users groups throughout the country.

The work program described above covers one year's duration and is designed to get the project organized, initiate data collection for systems analysis, explore transfer of work from other jurisdictions, prepare work plans to continue the project and keep the current level of data processing in Gainesville stable. As the year draws to a close, it will be possible to determine the exact number of additional steps, if any, which the city can undertake. This effort, of course, depends on manpower and finances. As a minimum, however, the city should prepare a work plan which will outline the next year's program in terms of Plans for Data Synthesis, Plans for Documentation of Systems Analysis, Presentation of Systems Analysis findings, decision points, transfer possibilities, development requirements and continued strategy for project completion. To assist in this planning, the next section of this paper will address the possible alternatives, should additional funding be available.

Section VI

Second Year Plan

Section VI

Second Year Plan

The following discussion will treat the material as if it were to be dealt with in the second year of the project. Should finances and/or time remain during the first year grant, these activities will be pursued in the priority as they are listed here. The activities to be considered are:

A. Continuation of Systems Analysis.

B. Pursuit of material with respect to conceptualized, designed or running systems which can be transferred to Gainesville.

C. Development of Hardware Specifications and initiation of hardware acquisition.

A. Continuation of Systems Analysis - By far the most important of these three activities is the continuation of systems analysis so that the results of this effort can become a part of the planning for the City of Gainesville.

This activity will include data synthesis, documentation of results, presentation of systems analysis findings and decision points for the city management.

Data synthesis is the key element to be accomplished in the systems analysis effort. This activity involves the correlation of collected information with systems analysis objectives. Basic relationships are explicitly defined between data files, information, processes, flow of information, and use of information. The basic tools to be used will be event matrices, decision flow matrices, information availability matrices, management information requirements, and decision requirements. The collected data will be examined via these tools as well as through the use of Meta-Data, Rate or Data Cataloger; all of which are to provide assistance in the analysis of information requirements.

The reported results will be documented, compared with existing analysis findings of other localities, reviewed and approved by the user Steering Committee and will become a part of the input to the Systems Conceptualization effort. The documentation will be at three levels; (1) Executive Management, (2) Operational Management, and (3) Conceptualization and design technical staff. In addition to the documented results, the systems Analysis findings will be presented to the operational management. These individuals will aid in the modification of the results, as appropriate, just prior to the presentation of the results of systems analysis to the Policy Board and City Commission.

The presentation will be geared toward helping the city to decide on one of three possible courses of action. The first course of action would be to stay with the manual system. The second course of action would be to semi-automate the system, while the third course is full automation in the integrated fashion. Each of these decisions will have major impact on the many parameters of the system, including, but not limited to:

1. Forms, files, and forms control
2. Communications
3. Information Exchange
4. Integration
5. Future Plans
6. Hardware
7. Software
8. Personnel
9. Facilities
10. Conceptualization
11. Design
12. Development

13. Implementation

14. System Evaluation

The decision, to be made at this point in the project, will determine the whole future of the project and cannot be guessed at this early in the system plan. Nor can more detailed work plans be formulated until that decision is made. Assuming, however, that the decision were either to semi-automate or automate the system, the next series of activities will deal with transfer.

B. Pursuit of material which will enhance transfer - One of the major premises of this project is that once the environment has been created for transfer, we will be able to transfer some computer processes and products into Gainesville so as to reduce development cost and decrease the time lag from design to implementation. Gainesville intends to pursue this line of reasoning in conceptualization, design and development insofar as possible. Therefore, conceptualization and design work will focus on comparing the Gainesville environment with those other localities around the nation who have already completed these tasks. As similar systems are found, every attempt will be made to transfer the work already completed. Actual conceptualization, design, and development will take place only if no system can be found for transfer. Thus, the second major thrust of the second year program will be to identify those systems which will provide the highest payoff to the city in terms of transfer of operational systems.

The conduct of these two major activities will have a significant bearing on the specific sub-system which the city elects to implement first.

C. Hardware Specifications and Acquisition. Once the entire system specifications have been delineated by the analysis and conceptualization task teams, the next step in the program is to use this information in the development of hardware specifications. City personnel will require some assistance in the hardware specification process and the acquisition of computer hardware. This assistance in acquisition of computer hardware can be obtained through Public Technology, Inc., to which Gainesville is a subscriber. It is anticipated that the hardware could be

installed sometime late in the second year of the projects' life.

The projection of continued activities for third, fourth, and fifth year activities are purely conjecture with no basis in fact. Until the first steps are taken, it will be hard to predict the impact over additional periods of time. As the dynamics of the city change, so will the emphasis in information systems development change.

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Section VII

Conclusion

Section VII

Conclusion

The City of Gainesville, Florida has spent a considerable amount of time and effort determining the most advantageous approach to be taken in the development of information systems. The approach chosen is to develop an integrated municipal information system for the reasons as stated in Section II under the heading of Environment of Integrated Municipal Information Systems.

This document has laid out a detailed first year work plan which will allow the city to organize for the systems development effort, assign personnel, conduct orientation and training, and initiate the data collection aspect of systems analysis. In addition, planning techniques for conducting such a project and the management tools for ensuring success of the project will be developed. Simultaneously, the initial thinking will be underway for acquisition of computer hardware by the city, transfer of systems from other cities in the nation, and continuing to keep the current data processing environment stable.

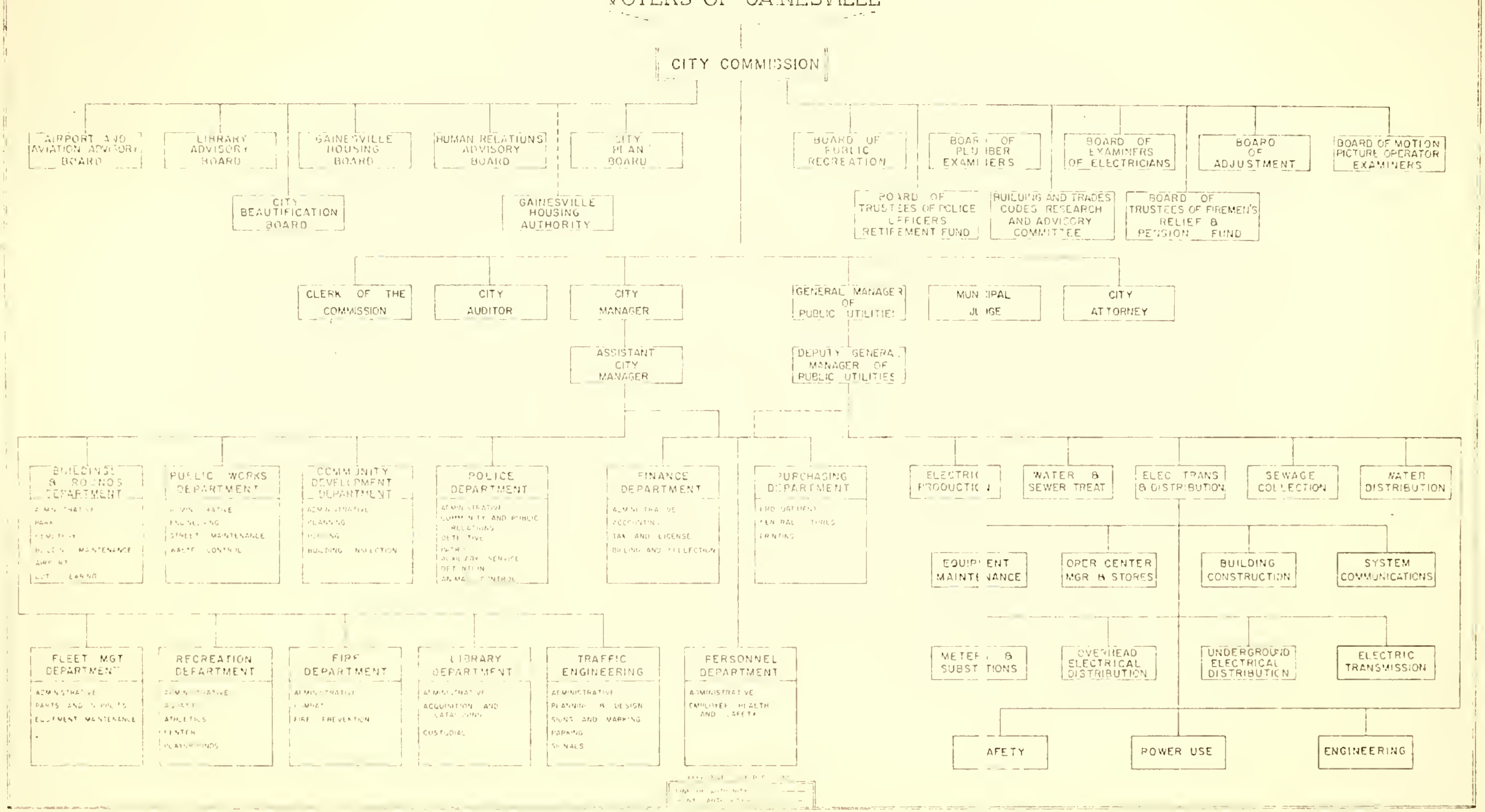
The second year plan, while more general in nature, recognizes the need to complete systems analysis, present the findings and face the relevant decisions about the future of the project. It is anticipated that by the end of the second year of the project, hardware will be installed and a planned, orderly progression of sub-system components will be undergoing implementation.

APPENDIX 1

City of Gainesville

Organization Chart

ORGANIZATION CHART OF
THE MUNICIPAL GOVERNMENT OF GAINESVILLE, FLORIDA



APPENDIX 1

APPENDIX 2

Functional Department
Manager Areas of Interest
And Linkages to Other Departments

Functional Department Manager
Areas of Interest and
Linkages to Other Departments

In the preliminary review of the City of Gainsville, as part of an assessment of the feasibility of an I.M.I.S., eleven functional department managers were polled as to what interests they had in utilization of the computer as a tool and in defining the specific areas where they interfere with other elements of the municipal government. This information is vital as a first step toward building the total systems analysis overview of the city.

Appendix 2 is an illustration of several samples of the types of interests which the department managers showed, and their linkages with other departments in performing their duties. This sample will be totally expanded in the systems analysis.

Community Development

Interests

1. Land Use & Zoning
2. Census Data Usage
3. Panel Files with Respect to Assessed Value
4. Vacancy Ration and Occupancy Changes
5. Occupational Liscenses
6. Population Projections as Impacting Land Use.
7. Inventory of Environmentally Sensitive Areas
8. Housing Inspection

Linkages

1. Traffic Engineer
2. Building Inspection
3. Fire
4. Police
5. Utilities
6. Regional Planning Agency
7. County Planning
8. County Assessor
9. Health
10. Hotel and Restaurant Commission
11. Fleet Management
12. Welfare
13. Housing Authority

Traffic Engineering

Interests

1. Accident Analysis
2. Correlate Vehicles, Population, and Auto Registration
3. Merge Address Coding Guide and Auto Registration
4. Parking Meter Maintenance Inventory and Location Collective
5. Emergency Routing Information
6. Street Inventory

Linkages

1. Community Development
2. Police
3. Fire
4. Public Works
5. Schools

6. Regional Planning Council
7. Building and Grounds

Personnel

Interests

1. Employee Classification Summary
2. Employee Turnover Report
3. Employee Payroll Report
4. Alphabetical Employee List
5. Complete Personnel/Payroll System

Linkages

1. All Municipal Departments
2. State Department of Labor
3. State Employment Security Commission
4. Federal Bureau of Labor Statistics
5. State and Local Statutes
6. Workman's Compensation Act
7. Government Employees Retirement System
8. Insurance Advisory Committee

Public Works

Interests

1. Notification of New Families for Refuse Service
2. Project Accounting
3. Street Inventory
4. Information on Owner for Right of Way Purchases
5. Critical Path Method Scheduling for Construction Project

Linkages

1. Traffic Engineering
2. Building and Grounds
3. Community Development
4. Fleet Management
5. County Engineer
6. Central Stores
7. Police
8. County Waste Control

Law Enforcement

Interests

I. Officer Safety
    1. wanted persons
    2. stolen vehicles
    3. criminal history
    4. incident type by location
    5. stolen property
    6. vehicle registration
    7. suspended/revoked drivers license
    8. registered felons (by crime classification)

II. Resource Allocation/ Command and Control

Resource Allocation

    1. Dispatch information (type of call, times, type of reports taken, units assigned, beats, address/location)
    2. Officer activity (beats assigned, travel, self-initiated activity)
    3. Crime reports (victim, address/location, classification, times, dates)
    4. Incident reports (victim, address/location, classification, times, dates)
    5. Traffic reports (accidents, violations, locations)
    6. Field interrogation (address/location, interviewee, time, date)
    7. Address Coding (X-Y coordinate system, blocks, block facing)
    8. Evaluation of the effect of any of the above programs.

Command and Control

1. Directed field activity (planned deployment, varying shifts and manning, directed prevention patrolling)
2. Automated or semi-automated dispatching
3. Team police assignments based on projected workload
4. Adjusting patrol beats to workload
5. Emergency operation conditions (civil disorders, natural disaster, annual events - parades, ballgames, etc.)
6. Mutual aid systems
7. Evaluation of above

III. Crime Analysis

1. Crime mapping
2. Correlation systems (events, crimes, offenders)
3. File search techniques (methods of operation, names, partial identification)
4. Identification (fingerprint system, photograph (mug system)
5. Crime Laboratory support
6. Organized crime
7. Intelligence systems
8. Evaluation of above.

IV. Statistics

1. Agency information (workload/workload counts, utilization, effectiveness (arrest/conviction).
2. Uniform crime reporting
3. Offender-based transactions (arrest processing, disposition)

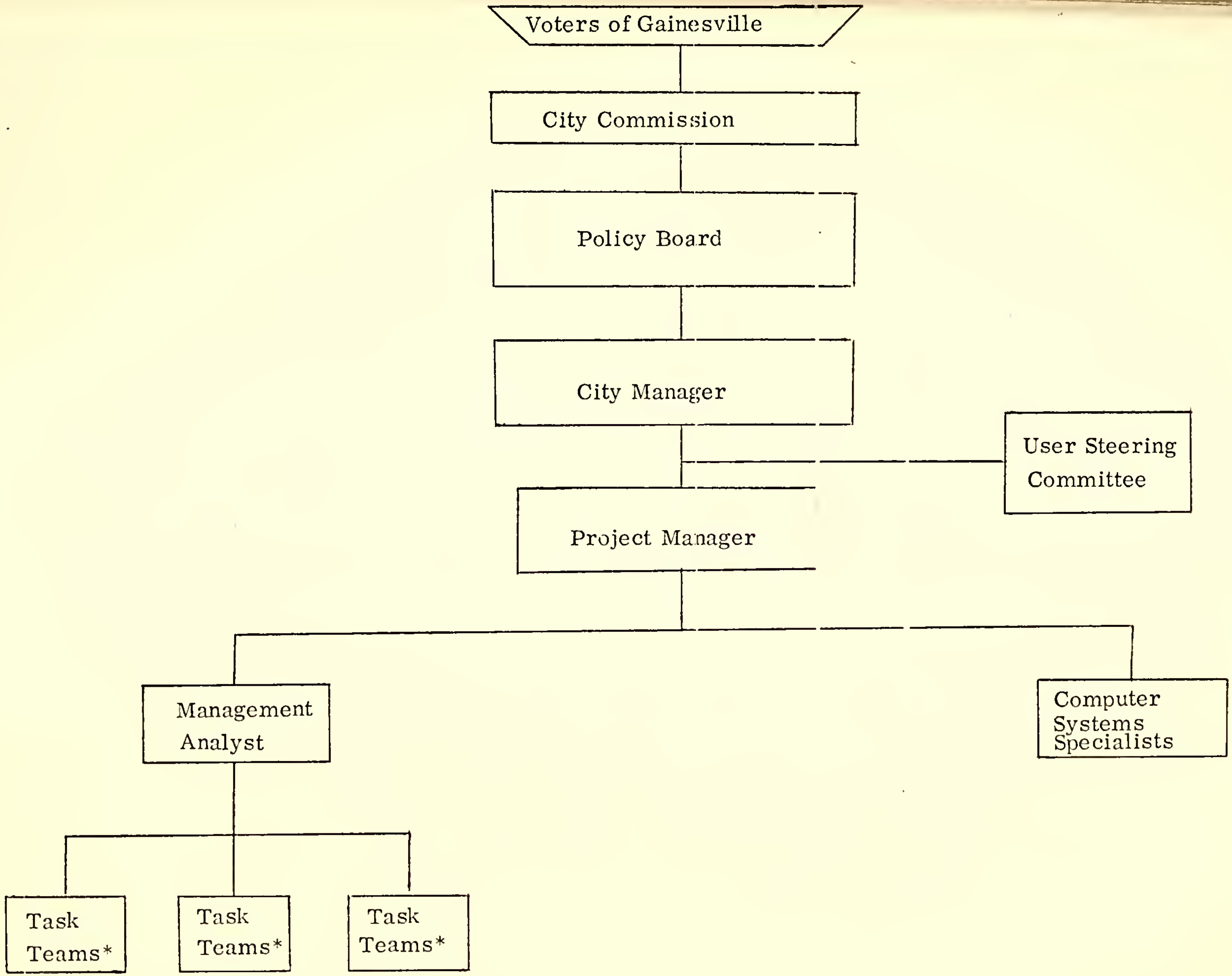
V. Comprehensive Management Information System

1. Accounting systems (budget, inventory, plant property, payroll)
2. Personnel systems (sworn, non-sworn)
3. Record systems (cross indexcs, more efficient storage and retrieval)

Appendix 3

City of Gainesville

IMIS Initial Organization Chart



* Number determined by priorities of city - Staffed by various departments

APPENDIX 4

Project Personnel Qualifications

Suggested Qualifications
Project Manager

- Possess broad experience in Public Administration
- Well versed in the theory and practice of systems methodology in local government
- Subscribe to the concepts of Integrated Municipal Information Systems
- Ability to motivate people
- Ability to communicate, express, understand, and develop ideas
- Ability to converse fluently in non-technical terms in presenting systems terminology to non-systems people
- Ability to plan, organize, manage, and control a large Systems Development effort
- Thorough knowledge of data processing practices, methods, principals and techniques relative to the management, application and operation of a high speed computer center complex
- A total of five years experience involving work with computers and associated equipment with at least two years experience managing a data processing installation on a systems project
- Thorough knowledge and understanding of the organizational, informational, and decision requirements in a local government environment

Suggested Qualifications
Management Analyst

- Possess experience in Public Administration in one or more functional areas
- Understand the theory and practice of systems methodology in local government
- Subscribes to the concept of Integrated Municipal Information Systems
- Ability to understand organizational environments and the manner in which people function in the environment
- Ability to direct, train, and assist others in the conduct of techniques pertaining to the systems approach
- Ability to converse fluently in non-technical terms in presenting systems terminology to non-systems people
- An understanding of the language, theory, and practices employed in designing and implementing automated systems.

- A logical, orderly approach to any project undertaken
- Experience and skill in assisting people to analyze a situation to determine the essential.
- Thorough knowledge of local government requirements in information, procedural, and decision matters.

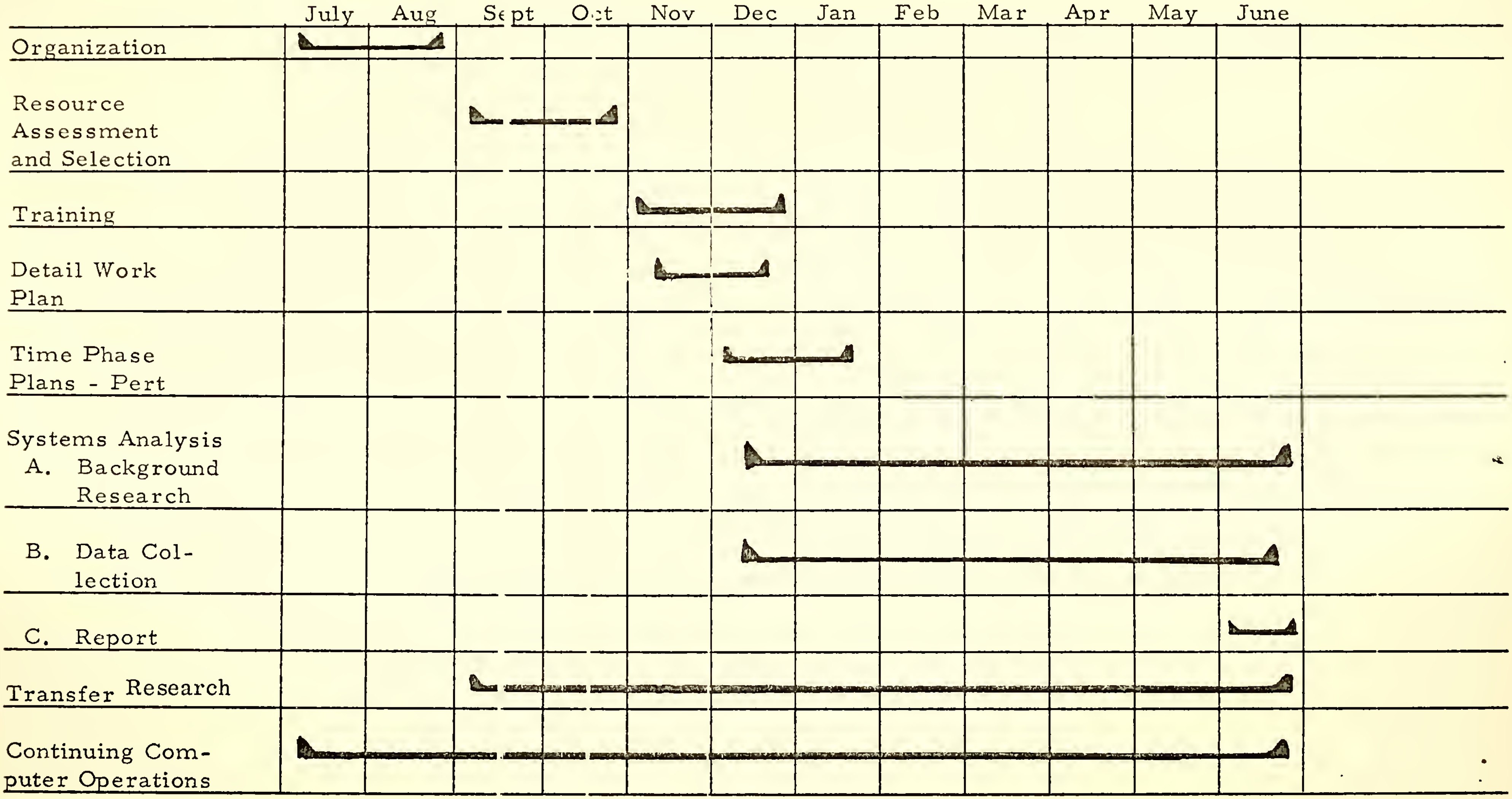
Suggested Qualifications
Computer Systems Specialist

- Knowledge of and ability to operate high speed computers
- Analytical skills and interests directed toward means of effective computer utilization
- An understanding and appreciation for systems principles and a subscriber to the Integrated Approach to building information systems
- Ability to program efficiently in one or more programming languages, preferably CUBOL or FORTRAN
- College graduate with course work in mathematics, statistics, algebra, and accounting desirable
- Additional course work in programming and systems design

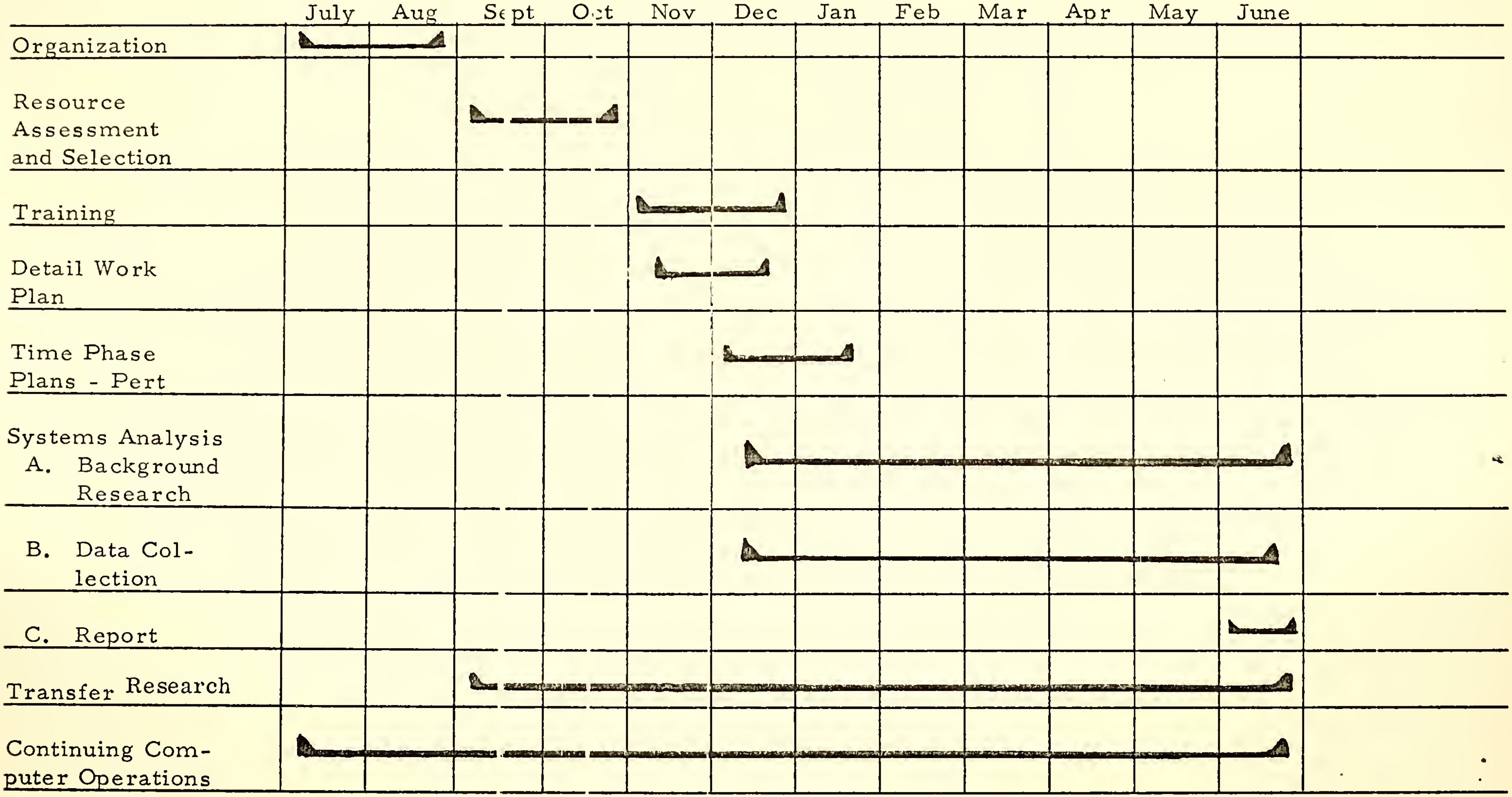
Appendix 5

Integrated Municipal Information System
First Year Development Plan

Integrated Municipal Information System
First Year Development Plan



Integrated Municipal Information System
First Year Development Plan



Appendix 6

Integrated Municipal Information System

First Year Staff - Budget

Task	Personnel	July		August		Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		March		April		May		June		Total
		I	T	I	T	I	T	I	T	I	T	I	T	I	T	I	T	I	T	I	T	I	T	I	T	
ganization	City Mgr. Staff	1874	1874	1874	1874																					$3748
source sessment Selection	Project Mgr.					1875	4208	1875	4208																	$8416
	Management Analysis					1333		1333																		
	Computer System Specialist					1000		1000																		
raining	Project Manager									1875	4208	1875	4208													$8416
	Management Analysis									1333		1333														
	Computer System Specialist									1000		1000														
tail Work ın-Time ase Plans	Project Manager	Salary Covered in November - December Time - To be accomplished Simultaneously with Training																								
	Management Analysis																									
ystems nalysis	Project Manager													1875	3208	1875	3208	1875	3208	1875	3208	1875	3208	1875	3208	19248
	Management Analysis													1333		1333		1333		1333		1333		1333		
ransfer Research	Computer System Specialist													1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	6000
	TOTALS	1874		1874		4208		4208		4208		4208		4208		4208		4208		4208		4208		4208		$45,828

Appendix 6
(See notes next page)

Notes

1. Salaries excluding fringes
   - a. Project Manager - $22,500
   - b. Management Analyst - $16,000
   - c. Computer System Specialist - $12,000
   - d. City Manager Staff - $21,278

2. I= Individual for month
   T= Total for month

3. Continuing computer operations. Task not included in these costs since that is an on-going task.

Appendix 7

Sub - System Suggested Components

Physical - Economic Development
Sub System
(Sample)

1. Community Development
    - 1.1 Population
        - 1.1.1 Census
        - 1.1.2 Migration
        - 1.1.3 Projections
        - 1.1.4 Geocoding
    - 1.2 Land
        - 1.2.1 Land Activity
        - 1.2.2 Assessments
        - 1.2.3 Inspections/Permit
        - 1.2.4 Platting
        - 1.2.5 Mapping
        - 1.2.6 Census
        - 1.2.7 Utilities
        - 1.2.8 Geocoding
    - 1.3 Transportation
        - 1.3.1 Trafficways
        - 1.3.2 Traffic Control
        - 1.3.3 Mass Transit
        - 1.3.4 Water
        - 1.3.5. Air

1.4 Economic Development
- 1.4.1 Employment/Occupation
- 1.4.2 Industrial/Commercial Development

- 1.4.3 Tax Base
- 1.4.4 Banking
- 1.4.5 Indicators

1.5 Utilities

- 1.5.1 Municipal
- 1.5.2 Private
- 1.5.3 Networks
- 1.5.4 Engineering

1.6 Environment

- 1.6.1 Water
- 1.6.2 Solid Waste
- 1.6.3 Air
- 1.6.4 Soil

2. Financial Information Subsystem (Sample)

- 2.1 Accounting
    - 2.1.1 General Ledger
    - 2.1.2 Revenue
    - 2.1.3 Treasury
    - 2.1.4 Receivables
    - 2.1.5 Payables
    - 2.1.6 Appropriations
    - 2.1.7 Fixed Assets
    - 2.1.8 Cost Allocations
    - 2.1.9 Program/Project
- 2.2 Purchasing
    - 2.2.1 Requisition/Purchase Order Processing
    - 2.2.2 Vendor Information
    - 2.2.3 Commodity Availability
    - 2.2.4 Procurement History
- 2.3 Budgeting and Fiscal Planning
    - 2.3.1 Budget Programming
    - 2.3.2 Capital Budgeting
    - 2.3.4 Operational Budgeting
- 2.4 Personnel/Payroll
    - 2.4.1 Payroll
    - 2.4.2 Time Reporting
    - 2.4.3 Skills Availability
    - 2.4.4 Budget Projections
    - 2.4.5 Position Accounting
    - 2.4.6 Benefit Management

2.5 Resource Management
  2.5.1 Material Reporting
  2.5.2 Inventory Control
  2.5.3 Warehousing
  2.5.4 Commodity Availability

3. Public Safety Information Subsystem (Sample)

- 3.1 Investigation
  - 3.1.1 Criminal Histories
  - 3.1.2 Case Histories
  - 3.1.3 Identification
  - 3.1.4 Arrest and Booking
  - 3.1.5 Clearance
  - 3.1.6 Historical and Statistical Analysis
- 3.2 Prevention
  - 3.2.1 Field Support
  - 3.2.2 Field Unit Dispatching Support
  - 3.2.3 Complaint Handling
  - 3.2.4 Arrest and Booking
  - 3.2.5 Resource Allocation
  - 3.2.6 Intelligence
  - 3.2.7 Historical and Statistical Analysis
- 3.3 Enforcement
  - 3.3.1 Criminal Histories
  - 3.3.2 Arrest and Booking
  - 3.3.3 Regional/State/Federal Interface
  - 3.3.4 Resource Allocation
  - 3.3.5 Statistical Analysis
- 3.4 Judiciary
  - 3.4.1 Traffic
  - 3.4.2 Criminal
  - 3.4.3 Civil
  - 3.4.4 Subject in Process
  - 3.4.5 Resource Allocation

3.5 Corrections

3.5.1 Subject in Process

3.5.2 Parole

3.5.3 Evaluation

Physical - Economic Development Sub System (Sample)

1. Community Development

   1.1 Population

      1.1.1 Census

      1.1.2 Migration

      1.1.3 Projections

      1.1.4 Geocoding

   1.2 Land

      1.2.1 Land Activity

      1.2.2 Assessments

      1.2.3 Inspections/Permit

      1.2.4 Platting

      1.2.5 Mapping

      1.2.6 Census

      1.2.7 Utilities

      1.2.8 Geocoding

   1.3 Transportation

      1.3.1 Trafficways

      1.3.2 Traffic Control

      1.3.3 Mass Transit

      1.3.4 Water

      1.3.5 Air

   1.4 Economic Development

      1.4.1 Employment/Occupation

      1.4.2 Industrial/Commercial Development

      1.4.3 Tax Base

1.4.4 Banking

1.4.5 Indicators

Date Due

Due	Returned	Due	Returned

City of Gainesville, work UGA
352.075979 P976c

Call No.: 352.075979
P976c

Author: Public Technology, inc.

Title: City of Gainesville, work plan for the development of an integrated municipal information system.

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